

The opinion in support of the decision being entered today was *not* written for publication and is *not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte EMANUEL ISRAEL COOPER,
THOMAS EDWARD DINAN,
LUBOMYR TARAS ROMANKIW, and
HONG XU

Appeal 2006-2459
Application 09/634,171
Technology Center 1700

Decided: February 23, 2007

Before CHUNG K. PAK, CATHERINE Q. TIMM, and
LINDA M. GAUDETTE, *Administrative Patent Judges*.

TIMM, *Administrative Patent Judge*.

DECISION ON APPEAL

In accordance with 35 U.S.C. § 134(a), Appellants appeal from Examiner John P. Sheehan's decision rejecting claims 1, 3-10, and 28-30 under 35 U.S.C. § 103(a). We have jurisdiction.

We affirm.

BACKGROUND

Appellants' application, filed on August 9, 2000, discloses a Cobalt-Iron (CoFe) soft magnetic film having magnetic properties well suited for magnetic recording head applications (Specification 1:6-9). A key property of the film is its saturation magnetization. There is a need in the art to obtain a saturation magnetization that approaches the theoretical limit of 2.40-2.45 Tesla (Specification 1:28 to 3:16). Claim 1 is illustrative of the subject matter on appeal:

1. A cobalt-iron binary alloy electroplated film having a saturation magnetization of 2.30 Tesla or greater, said film being anisotropic and consisting of a binary alloy $(100\%-x)\text{Co}(x)\text{Fe}$, where x is between about 60% and about 75% by weight.

The Examiner concludes that the subject matter of the claims would have been obvious to one of ordinary skill in the art within the meaning of 35 U.S.C. § 103(a). To support the rejection, the Examiner relies on the following prior art references:

Mallory	US 4,695,351	Sep. 22, 1987
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E.M. Kakuno et al., *Structure, Composition, and Morphology of Electrodeposited $\text{Co}_x\text{Fe}_{1-x}$ Alloys*, 144 J. Electrochem. Soc. 3222-26 (Sept. 1997)

The rejection is stated as over Kakuno taken in view of the admitted prior art and Mallory (Answer 4).

DISCUSSION

Appellants contend that the alloy films suggested by the combination of Kakuno and Mallery would not possess a saturation magnetization of 2.30 Tesla or greater as called for by the claims. The Examiner contends that, based on identity of composition and substantial similarities in the electroplating process for making the film, it is reasonable to conclude that the end product film would have the properties claimed. The dispositive issue is: Does a preponderance of the evidence support the conclusion that a film suggested by the prior art would have a saturation magnetization of 2.30 Tesla or greater?

The dispute in this case turns on the facts. We note at the outset that the Examiner has set forth well supported cogent findings of fact in the rejection with regard to what the references and admitted prior art teach (Answer 4-5). We emphasize the following facts:

Appellants' invention is directed to an electrodeposited (40-25 wt.%)Co(60-75 wt.%)Fe film having improved saturation magnetization. Appellants attribute the improved saturation magnetization to the lack of impurities such as oxygen (Specification 3:1-16) and nitrogen in the film (Xu Declaration 3:11-13).

The claims on appeal do not limit the level of oxygen or other impurities in the film. Instead, the claims define the film product in terms of its properties, namely, its saturation magnetization property and its related anisotropic morphology.

The Kakuno research paper investigates the structure, composition, and morphology of electrodeposited CoFe alloys having applications in the magnetic recording industry (Kakuno, Title and Introduction). Magnetic

recording applications require magnetic properties and the desired magnetic properties are obtained by applying a saturating magnetic field during plating (Mallary in its entirety).

Kakuno describes specific electroplated films with compositions within the claimed range of between 25-40 wt. % Co and 60-75 wt. % Fe. For instance, Kakuno exemplifies $\text{Co}_{30}\text{Fe}_{70}$ films in examples 7-9 of Table 1. Those examples have a weight percent composition approximating (30 wt.%)Co(70 wt.%)Fe (Kakuno, p. 3224). See Kakuno's Figure 3 and the table on page 7 of the Xu Declaration showing the approximately one-to-one correlation between atomic percent and weight percent.

In important respects, the electroplating process of Kakuno is identical or substantially identical to Appellants' electroplating process. Both use an aqueous plating bath plating cobalt and iron from cobalt salts and ferrous salts, respectively (Specification 18:1-12: any cobalt salts and any ferrous salts; Kakuno 3222, first paragraph under "Experimental": cobalt sulfate and iron ammoniac-sulfate). Plating current densities are similar. Kakuno's current density of 10 to 50 mA/cm^2 (Kakuno p. 3223, col. 1, ll. 1-3) largely overlaps Appellants' broadly disclosed range of about 3 to about 40 mA/cm^2 and encompasses Appellants' most preferred range of about 10 to about 20 mA/cm^2 (Specification 15:24-31). Kakuno plates the film onto a copper substrate (Kakuno, p. 3222, first paragraph under "Experimental"), one of Appellants' named substrates (Specification 16:11).

The film created by Kakuno is 0.3 microns thick (Kakuno, p. 3222, first paragraph under "Experimental"), a thickness within the thickness range of up to 2 microns disclosed by Appellants (Specification 12:30-31).

There are some differences in the plating bath chemistry. Appellants include a buffer, mono- or polycarboxylic acid(s), and an aromatic sulfinic acid or salt thereof in their bath (Specification 11:20-25). The purpose of the carboxylic acid, other than to say it can also be used as a buffer, is not disclosed (Specification 16:19-32), nor is the purpose of the aromatic sulfinic acid or salt (Specification 18:24 to 19:20).

Appellants control the pH through buffers while Kakuno does not. However, the pH levels of the bath solutions are substantially similar. The Xu Declaration reports a pH of 3.55 for a bath prepared to approximate the Kakuno bath (Xu Declaration, p. 6). Appellants' plating bath is characterized by a pH of about 2.5 to about 3.5 with a preference for a pH range of about 2.8 to about 3.2. Kakuno also reports that pH decreases as iron levels increase (Kakuno 3223, col. 2, ll. 4-6).

In a case such as this where patentability rests upon a property of the claimed material not disclosed within the art, the PTO has no reasonable method of determining whether there is, in fact, a patentable difference between the prior art materials and the claimed material. Therefore, where the claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes, the PTO can require an applicant to prove that the prior art products do not necessarily possess the characteristics of his claimed product. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977).

We find that the Examiner has provided sufficient evidence to establish a prima facie case of obviousness as to the appealed claims. Kakuno uses the same starting materials as disclosed by Appellants, salts of cobalt and iron, in substantially the same electroplating process, to plate

CoFe film of identical composition onto the same type of substrate to the same type of thickness for the same intended use, formation of magnetic recording head materials requiring a magnetic saturation. It is reasonable to believe, based on the similarities in Kakuno's and the claimed starting materials and processes for making magnetic recording heads, that the magnetic recording head product taught by Kakuno will have the magnetic saturation property claimed. The burden thus shifts to Appellants to prove otherwise.

Appellants attempt to rebut the prima facie case by arguing that Kakuno's films are produced by a process substantially different from Appellants' process. They point out that the Specification discloses the use of specific additives in the plating bath which are not used by Kakuno and that they control the pH. Appellants contend that their film is substantially free from oxygen and iron oxide and this property results in higher magnetic saturation levels (Br. 7). In support of their position, Appellants rely upon the Xu Declaration.

In considering the issue anew, the following additional facts become relevant.

The Xu Declaration compares films made analogously to the process of Kakuno with films made by the inventive process.

Xu, one of the inventors, declares that for films comprising 64 wt. % Fe, the magnetic moment for Kakuno's film is 2.2 Tesla compared with 2.4 Tesla for the inventive film (Declaration 10:7-9).

The Xu Declaration reports no saturation magnetization values for any other films made in accordance with the process of Kakuno.

We reiterate that the burden is on Appellants to show that, indeed, the film claimed is patentably different from the prior art film. Considering all the evidence anew, we conclude that Appellants have not met their burden.

There is only one direct comparison, the comparison between 64 wt. % Fe containing films. A direct comparison can be compelling if the data is commensurate in scope with the claims which the evidence is offered to support. *In re Marosi*, 710 F.2d 799, 803, 218 USPQ 289, 292-93 (Fed. Cir. 1983). The data relied upon by Appellants to establish nonobviousness in this case is not sufficiently commensurate in scope with the claims on appeal. Appellants claim CoFe films having about 60 to about 75 wt. % Fe, but Appellants report saturation magnetization for only one Kakuno film and that value, at 64 wt. % Fe, is at the lower end of the range. We cannot say that Appellants have sufficiently shown that all the films described by Kakuno, and specifically, the 70 wt. % films, have saturation magnetization values outside of the claimed range.

The Declaration also attempts to differentiate the inventive CoFe films from the prior art film based on impurity level. But the absence of impurities from the film is not claimed, it is the saturation magnetization that is claimed. The Declaration states that impurities such as oxygen and nitrogen reduce the magnetic moment by reducing the volume fraction of the magnetic atoms Fe and Co (Declaration (11) at p. 12). The Declaration also reports data on impurity levels of about 60 wt. % Fe films (Declaration (11)) and data on properties such as brittleness, resistivity, crystalline grain size, and texturing, said to indicate the presence of impurities (Declaration (9) and (10)). But the Declaration does not convincingly establish that the impurities are present in the CoFe films of Kakuno at levels necessarily

resulting in saturation magnetization below the claimed level of 2.3 Tesla. It is not enough to establish that some of Kakuno's films have impurities, Appellants must establish that Kakuno's films do not possess the actually claimed property, i.e., the saturation magnetization of 2.3 Tesla or greater.

Nor can we agree that the data in the Declaration supports Appellants' statement that "in order to achieve the magnetic moment of at least 2.3 Tesla, the plated CoFe films have to be substantially free of oxygen and other impurities such as nitrogen." (Declaration (5), last sentence). This contention is not convincingly supported by evidence. The Declaration provides only one data point for the saturation magnetization at 64 wt. % Fe. It does not provide impurity concentration levels for that data point, only indirect measurements of other properties such as resistivity. The Declaration provides impurity concentration levels for a different composition, one containing 60 wt. % Fe, but it does not provide the saturation magnetization value for that data point. Appellants' statement is not sufficiently supported.

The evidence as a whole supports the determination of the Examiner. Therefore, we conclude, based upon the preponderance of the evidence, that the Appellants' claimed invention would have been obvious to one of ordinary skill in the art within the meaning of 35 U.S.C. § 103(a).

CONCLUSION

In summary, we affirm the decision of the Examiner.

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No time period for taking any subsequent action in connection with this appeal maybe extended under 37 C.F.R. § 1.136(a)(1)(iv) (2006).

AFFIRMED

tf/hh

Marvin Bressler
Scully Scott Murphy & Presser
400 Garden City Plaza
Garden City, NY 11530